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DETERMINING THE OPTIMAL PARAMETERS OF LANDSCAPE ARCHITECTURAL ELEMENTS

Abstract. *The necessity of the development of architecture in modern economic conditions raises new challenges to architects and builders: the design of architectural objects in accordance with international standards. In this regard, this article discusses the harmonization of the architectural environment with using of the Corbusier Modulor. Examples of the tasks for students from the modern practice of architecture and urban planning are given.*

Modulor Corbusier combines the canons of the Golden ratio and the proportions of human size. The table for the use of the Modulor in educational design for finding of harmonious sizes of architectural structures and design products are given. Specific examples of correction of small architectural forms parameters, contours of buildings and constructions, width and length, elements of alleys and flower gardens are stated. Here, it is necessary to pay attention to the fact that the sketches of projects seamlessly comply the terrain, which is very important for the architectural and artistic expressiveness of city parks, squares and suburban recreational areas.

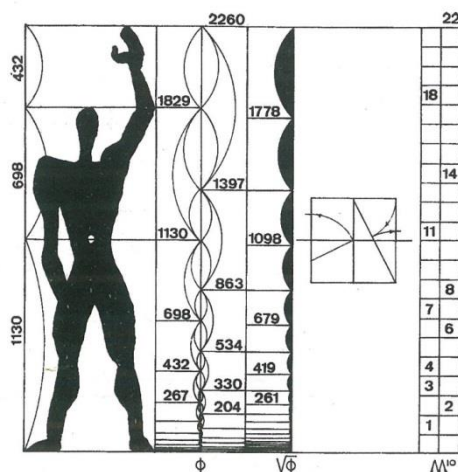
Keywords: *Modulor Corbusier, Golden ratio, architecture, the adjustment elements, the improvement of the city.*

Introduction

It is known that the training of students on the specialty of «Architecture» and «Architectural composition» subject plays the main role since this subject lays the foundation for the architectural and artistic expressiveness of designed buildings and constructions. In this regard, the need to develop architecture in the current economic conditions puts new challenges for future architects. These tasks are the design of architectural objects in accordance with high standards, and their inclusion in the list of tourism and recreation facilities if it possible.

In this article, the questions of harmonization of elements of improvement with use of the Modulor are considered. The Modulor was designed by the world-famous French architect Le Corbusier. In modern educational literature, not enough attention is paid to the application of the Modulor in practice. The authors propose to use it to determine the parameter of the elements of landscape architecture.

This famous Modulor Le Corbusier combines the canons of the Golden ratio and the proportions of human size. Le Corbusier successfully used Modulor in interior design, architecture and urban planning. Below is a table for the use of the Modulor in educational design to find the harmonious dimensions of design products and architectural structures.



The main quality of the Modulor is its compliance with the proportion of a person and the use of the principles of the «Golden section». The modulator has 2 scales. At the heart of the so – called «red series» is the height of a person (182, 9cm), at the heart of the «blue series» – the height of a person from the ground to the end of the raised arm (226cm). The numeric values of the modulator are shown in the table:

Table 1

«Red series»		«Blue series»	
centimeter	metre	centimeter	metre
95 280.7	952.80		
58 886.7	588.86	117 773,5	1177.73
36 394.0	363.94	72 788.0	727.88
22 492.7	224.92	44 985.0	449.85
13 901.3	139.01	27 802.5	278.02
8 591.4	85.91	17 182.5	171.83
5 309.8	53.10	10 619.6	106.19
3 281.6	32.81	6 563.3	65.63
2 028.2	20.28	4 056.3	40.56
1 253.5	12.53	2 506.9	25.07
774.7	7.74	1 549.4	15.49
478.8	4.79	957.6	9.57
182.9	1.83	365.8	3.66
113.0	1.13	226.0	2.26
69.8	0.70	139.7	1.40
43.2	0.43	86.3	0.86
26.0	0.26	53.4	0.53
16.5	0.16	33.0	0.33
10.2	0.10	20.4	0.20
6.3	0.06	12.6	0.12
3.9	0.04	7.8	0.08
2.4	0.02	4.8	0.04
1.5	0.01	3.0	0.03
0.9		1.8	0.01

According to the Module can be determined the optimal proportions; and is provided here the parameters of the alley as example: the length and footpath, flower beds along the path; the outer parterres of the stalls, the width of the green borders, the size of landscape elements with a symbolic value, dimensions, pergolas, gazebos, and so on.

Supporting Le Corbusier's Modulor architecture, Albert Einstein said: «It is a scale of proportions which makes the bad difficult and the good easy».

Below is a sample assignment for the finals and its execution is given.

Task: draw contour lines of small architectural forms: fountain, gazebo, garden bench, boutique, etc., using a module Le Corbusier.

Purpose: to instill skills to apply the module Le Corbusier in architectural design.

Materials: drawing paper of A-3 format, analogous drawings, Le Corbusier`s modular, pencils, rulers, and many others.

Results and discussion

Implementation: a student using analogues (or full-scale measurements) draws the outline lines of the LFA, determines (corrects) its parameters using the Le Corbusier`s modulor. Here, simple shapes should be used as the unique MAF will be designed in the next semester. Since Modulor Le Corbusier includes proportions of the Golden section, it is also convenient for the design of furniture, architectural and urban projects. Le Corbusier used the modulator to harmonize the interior of his own workshop, for architectural projects (house in Marseille) and the General plan of Chandigarh in India. He used only 15 interconnected sizes, which is convenient for unification of products [1].

In practical classes, a student first outlines the dimensions of the landscape elements approximately, then corrects and selects the most appropriate dimensions in accordance to Modulor, as shown in figures 3-5.

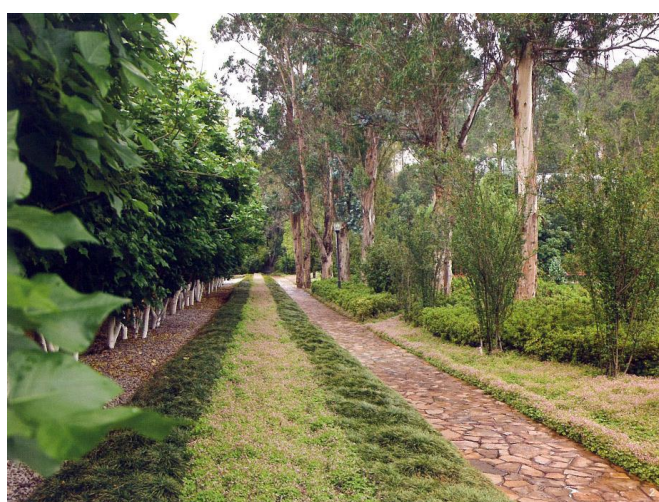


Fig. 1 – Using the Modulor to determine the parameters of alleys

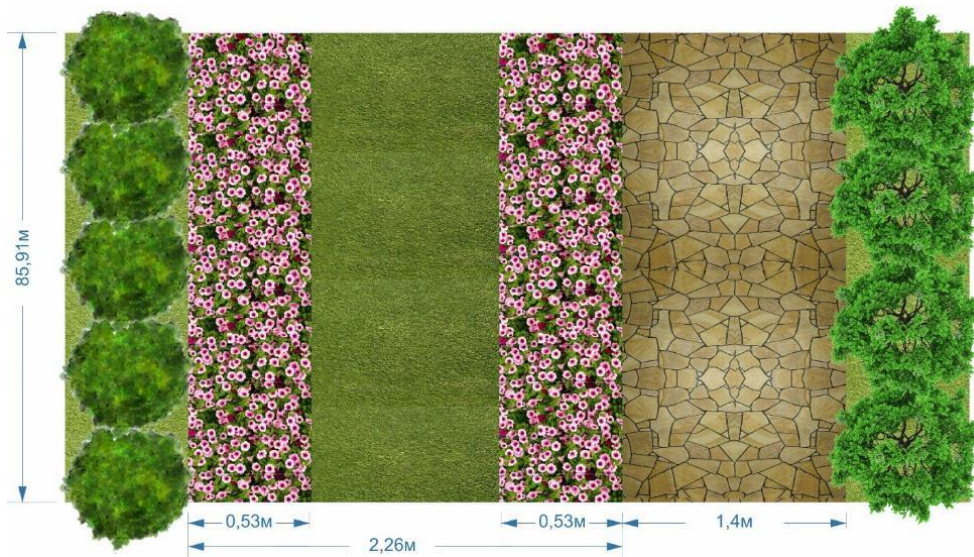


Fig. 2 – The parameters of the alley are adjusted in accordance to Modulor



Fig. 3 – Using the modulator to determine the parameters of the parterre

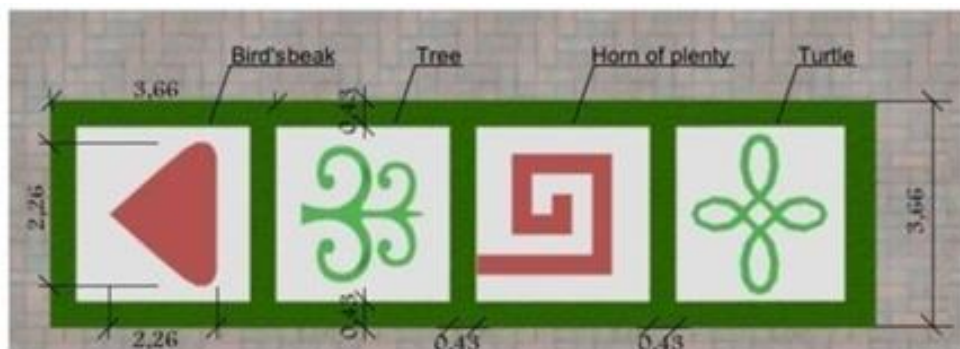


Fig. 4 – The parameters of the parterres are adjusted in accordance to Modulor

Conclusion

In the arid climatic conditions of Southern Kazakhstan, the issues of landscaping and improvement of urban parks and gardens, streets and yards are very relevant.

Therefore, it is proposed to optimize the configuration and size of gardens and parks taking into account FengShui and Corbusier modulus; here FengShui is used to determine the configuration of landscape elements of the second and third plan, and Corbusier modulus is used to determine the specific parameters of landscape elements with symbolic ornaments.

Design of small landscape forms, flower beds and garden beds. In historically developed avenues, where mainly the straight lines are involved, it is convenient to use modular flower gardens with symbolic ornaments [2]. For example, in order to revitalize the wide avenues of the park, on its central line should be arranged small modular flower gardens in a certain sequence. Therefore, pedestrians can enjoy their content and appropriate landscape design as they go along. Here, we should pay attention to the fact that the flower beds organically blend into the environment and become its symbolic accent, which is very important for the architectural and artistic expressiveness of the urban environment [3].



Fig. 5 – Use of Modulator for pavers and flower beds

Recommended dimensions: 70-flower bed /86-path/ 70-flower bed (cm)	Recommended parameters: 140-track/ 226-circle diameter/140-track (cm)
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ЛАНДШАФТТЫҚ СӘУЛЕТ ЭЛЕМЕНТТЕРІНІҢ ОҢТАЙЛЫ ПАРАМЕТРЛЕРІН АНЫҚТАУ

Андатпа. *Заманауи архитектураны қазіргі экономикалық жағдайға сай дамыту мәселесі сәулетшілермен дизайнерлерге жаңа талаптар қойып отыр, яғни сәулет нысандары халықаралық талаптарға сай жобалануы тиіс. Осылай себепті аталмыш мақалада сәулет ортасын Модульдерді қолдана отырып, гармоникалы үйлесімдеу мәселесі қаралады. Мұнда заманауи архитектурамен қал асалу ісінен студенттерге нақты мысалдар берілген. Корбюзье Модульдері алтын кесінді ережелерімен адам бейнесі өлшемдерін сәйкестеген, студенттерге ғимараттар мен дизайн формаларын үйлестірудің нақты мысалдары кесте түрінде келтірілген. Атап айтсақ, ғимараттардың контурларын, кіші сәулет формаларын, аллеялар мен гүлзарлардың ұзындығы және енін анықтау үлгілері берілген. Нобайлық шешімдерді жер қыртысымен үйлестіру қала сәулетімен бау-бақшалары келбетін келтіруге септігін тигізеді. Сонымен, Модульдерді іс жүзінде қолдану – қоршаған ортаны көркейтеуге және оны қала жұртына жайлы жобалауға бағытталып, қазіргі сәулет және дизайн ортасы талаптарын толық қамтиды. Келтірілген материалдар студенттердің оқу-тәжірибе жұмыстарына және сәулет-құрылыс жұмыстары үшін іс жүзінде қолдануға арналған. Қала келбетін әрлендіру ісін жетілдіре түсуге бағытталған нақты деректер болып табылады. Сәулеттік жобалау жұмыстарын жетілдіріп, заманауи талапқа сай мамандар дайындауға қажетті нұсқаумен қоса ережелер берілген.*

Түйін сөздер: *Корбюзье модулі, алтын қатынас, сәулет, тұзету элементтері, қаланы абаттандыру.*

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ОПРЕДЕЛЕНИЕ ОПТИМАЛЬНЫХ ПАРАМЕТРОВ ЛАНДШАФТНЫХ АРХИТЕКТУРНЫХ ЭЛЕМЕНТОВ

Аннотация. *Необходимость развития архитектуры в современных экономических условиях ставит перед архитекторами и строителями новые задачи – проектирование архитектурных объектов согласно международным стандартам. В связи с этим в данной статье рассматриваются вопросы гармонизации архитектурной среды с использованием Модуля. Приведены примеры выполнения заданий для студентов из современной практики архитектуры и градостроительства. Модуль Корбюзье объединяет каноны золотого сечения и пропорции размеров человека. Приводится таблица для использования модуля в учебном проектировании для нахождения гармоничных размеров архитектурных сооружений и дизайнерских изделий. Изложены конкретные примеры корректировки параметров малых архитектурных форм, контуров зданий и сооружений, ширины и длины, элементов аллея и цветников. Здесь следует обратить внимание на то, чтобы эскизы проектов органично вписались в рельеф местности, что очень важно для архитектурно-художественной выразительности городских парков, скверов и загородных рекреационных зон. Использование Модуля служит гармонизации окружающей среды, повышению ее комфортабельности и отвечает современным требованиям архитектуры и архитектурного дизайна. Данные материалы предназначены для использования как в учебном процессе, так и для реального проектирования архитекторов и строителей.*

Ключевые слова: *модуль Корбюзье, золотое сечение, архитектура, корректирующие элементы, благоустройство города.*